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the red on white, by bringing the gray of the gray-red ring nearer to neutral gray. He has, however, forgotten the *Axiom der Mischempfindungen.* Had he put his gray-red upon black, as well as upon its own gray and upon white, he would have found that the red shows best upon gray, *less well on black,* still more poorly on white; and had he put Müller's black-red upon his own gray, as well as upon black and white, he would have found that the red shows best on black, *less well on gray,* hardly at all on white. (These statements hold, at any rate, for the Hering red, which is definitely lighter than McDougall's light gray.) You can not, that is to say, if you are to get to a positive conclusion, take casual mixtures of light and color (casual gray-reds) and set them upon casual backgrounds of gray; before you work with grays, you must know the course of the chromatic limens, or must know at least the general tendency of that course. We do not, any of us, know either course or tendency; we know astonishingly little of the chromatic values of our colored papers; but we know enough to realize that the knowledge, in a case like the present, is essential to positive argument. Müller himself chose black and white with a reason; he chose them because they were, in the rough, the extremes of the light-series, and therefore gave him a maximal difference of light-excitation. Whatever, therefore, we may think of Müller's "altogether inconceivable" and of the crucial character of his experiment, we must recognize that the force of his demonstration is not impaired by McDougall's counter-experiment.

E. B. TITCHENER.

PERCIPIENTS, SENSE DATA, AND THINGS

THE perennial interest and difficulty of the problem as to our knowledge of the external world is very strikingly shown by the various attempts at a new treatment of the problem in the work of the American "New Realists," in the writings of Professor S. Alexander, its frequent treatment in recent proceedings of the Aristotelian Society, and in Bertrand Russell's "Our Knowledge of the External World."

My own humble contribution to this discussion will be a defense of realism, modified only by insistence on the organic and functional interdependence and correlation of percipients and perceived objects.

One must start with analysis of the simplest kind of knowledge of external things. It will not do to import physical and psychological speculations at the beginning of such inquiry. Speculations in this field must justify themselves, if at all, by rendering the facts of immediate experience more consistent. Putting aside all sophistication through theories, I find in my immediate apprehension of such things as the tree or the table only two factors, neither of which is reducible to the other. I find the object which I immediately apprehend as real, and the consciousness that I (whatever I may be, whether spiritual Ego or flux of cortically determined processes or mixture of both is now an irrelevant question) apprehend the object. I see that the tree is determinately round, brown, rough, about two feet in diameter, with branches and green leaves. I may call it a complex of sensory or perceptual qualities, but I do not mean thereby that it is a state of my consciousness.

I do not find that I have, as distinguishable factors, sensations which are purely mental processes and sense data (as does Mr. Russell). I am convinced, after prolonged reflection, that the assumption that sensations exist as mental processes has been responsible for most of the difficulties and confusions connected with this problem. I have ''feelings'' of esthetic joy at the tree's beauty, feelings of pain if a branch blows down and hits me. These feelings are subjectively mine, just as hunger, love, friendship, and all my other emotions. I suppose these ''feelings'' to be in part, perhaps wholly, due to modifications of my body acting on my conscious self. Perheps they result from the reaction of my psychical self to occasioning stimuli. Perhaps my psychical self is simply and solely the by-product of the action of a complex neurone-system. I am not concerned here with the metaphysical problem of the self and the body. Feelings and emotions, then, are subjective processes, belong only to this Ego. On the other hand, the sensory qualities of the objects which I immediately apprehend are *in the objects, not in my Ego.* They constitute the object in its objectivity. Mr. Russell says that all that I really see is a patch of color. For my own part I do not immediately see merely a patch of color. I see an object having determinate color, form, texture, etc., all blended together.[1] I can not perceive the one without the other. If I feel the tree in pitch darkness I do not perceive only a tactual surface sensation. The so-called sensations are artificial constructions, which the psychologist has invented in order to account for the genesis of perceptions out of simpler elements and for their multiform variations. Sensations are on the same footing as electrons. The psychologist is prone to say that we learn to perceive concrete objects by correlating visual, tactual, and other sensations. I hold that, from the very outset, and in the case of the vaguest perceptions, we immediately apprehend objective complexes of qualities, and that we learn to perceive better by discriminating and correlating objective complexes, by differentiating and relating their features more fully by analysis and synthesis, thus causing them to stand out more clearly from the vaguer background of the total external reality immediately apprehended. This vague continuum of reality is always the matrix of our determinate perceptions. Perceptual knowledge grows out of a vaguer, less discriminated, and less clearly correlated or coordinated immediate or intuitive knowledge. I do not believe that any baby ever had a purely visual and a purely tactual space, which it correlated. It had what, in psychological terms, we may call a vague and circumscribed visuo-tactuo-motor space field, which it analyzed and synthetized into a more definite or articulate spatial system. So with all of us. If we start with the assumption of sensations, which are just Humian "impressions" as the sole immediately given, we may argue from now until doomsday and we shall never be able to prove that there is an external world. Having started with an epistemological fiction, no wonder we can not get to reality. I suppose sensations were invented, among physicists and philosophers, as a convenient makeshift to account for the variations in human perception, and especially for those features of immediate reality which could not be conveniently measured, as well as for errors and illusions of all sorts. In time, like many another human makeshift, they have acquired the sacrosanct authority of a dogma. As to whether psychology still has need of them, as useful fictions, I leave to the psychologists. I opine that the behaviorist and the functionalist, when they are thoroughgoing, may find that they can dispense with them, except perhaps as pedagogical crutches.

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[1] I do not, of course, mean that there are no mediate factors in my perceptions.

Since I have no sensations, only feelings and immediate apprehension of objects, as complexes of sense qualities, I do not need to suppose that sense data *cause* sensations. I see no convincing evidence that the relation between my immediate apprehension of the tree and the tree is that of effect to cause. They are simultaneous in time and identical in nature. There is more in the tree than I apprehend, but that more is not inconsistent with what I apprehend. If you say that my apprehension is not of the tree as it is in itself, since the tree looks different from different positions and to different observers, I reply that there is no tree in itself as an isolated object and no observer as an isolated subject. Trees and observers are elements in a total spatio-temporal system of interacting things. I have good reason to believe that my being aware of the tree depends on my visual apparatus and on the light in the intervening and surrounding atmosphere. The sensory organs and the central nervous system are media of communication between my Ego and the tree, just as the atmospheric light is. If there is variation in any of the media of communication there will be variation in the object apprehended. If it were cloudy I should not see the tree so distinctly. If my eye were defective a similar result would follow. Similarly, this paper does not cause me to write this article. It and this JOURNAL are media of communication between my fellow students and myself. With reference to my cognizing Ego, my nervous system and end organs are just as truly parts of the external world as are the intervening lighted space and the tree. With reference to pure cognition, my whole body is an object in space, among other spatial objects. With reference to my feelings there is a peculiar and intimate relation between this body and my conscious Ego.

The sensory system is a means for enabling a center of consciousness, which, as unitary center of feeling and cognition, is associated in some kind of functional interdependence with a cortical nervous system, to go out into circumambient space and to apprehend the qualities and relations of things. The awareness of external things, as well as the awareness of one's own bodily states, is probably conditioned by cortical changes; but to say that awareness is merely a cortical change is to confuse two qualitatively distinct things. Some cortical change must occur without accompanying consciousness, and the cortical changes which are associated with acts of awareness, with feelings, desires, and voluntary acts, are unique kinds of cortical change by virtue of that association.

Is my mind out there where it apprehends the tree? If so, how can my mind be in my body and over yonder at the same time? The simplest solution of this problem is to admit that my mind is wherever it perceives anything. It is partly out there and partly in my body, since, while perceiving the tree, my mind is also conscious of the straining of eyes and head muscles, conscious that as a psychophysical organism I, as cognitive Ego, am attending to the tree. My mind, as actually conscious, is cognitively wherever the things that it apprehends are. Affectively and volitionally it is always centered in my body. Is it then in China, when I think of China? No. For I am conscious that my thought of China is not an immediate apprehension of China, but a mass of centrally located images. As contemplating or immediately apprehending things, the mind is translocal. To a limited extent and conditioned by light, air, and other media it traverses space with immeasurable velocity. Cognitively the mind is in the body only in so far as what the mind apprehends is its own bodily state. Affectively and volitionally the mind is, to a much greater extent, in the body since both the incitements to purposive action and the immediate instruments thereof are bodily. The body is chiefly, perhaps, a means of action. It is also certainly a condition of the mind's apprehension of what is spatially beyond the body. But it is not properly described as a cause of that apprehension, except in a very loose sense of the word cause. Nor does the sensory nervous system necessarily distort the nature of what is beyond itself. It is just as consonant with the facts, and much more in harmony with the conditions of a coherent theory of knowledge—one that does not begin by throwing away the common-sense conviction that we really perceive real things, as though the man in the street were a fool—to say that the sensory nervous system is the medium through which the mind goes out into space and travels around in it as to say that this system is the means by which the external world effects a burglarious entrance into the mind. Surely it is less repugnant to the actual nature of perception to suppose the mind to be a pervasive system or self-expanding entity that goes out into space than to suppose that the whole material world, in order to get perceived, must be concentrated into a dimensionless point somewhere in the brain.

Do I perceive the tree in one private space and you in another private space? Mr. Russell, in his very ingenious treatment in Chapters III. and IV. of "Our Knowledge of The External World," supposes every percipient to be like a Leibnizian monad which takes only private views of things. He defines the "thing" as the series of its aspects, and, starting from the series of aspects which constitutes every individual's private views of the thing, he constructs a perspective space, which seems to be the space to which, in some way, every one's series of private space-views refer. I am not at all sure that I follow all Mr. Russell's argumentation on this point. But it seems to me that his construction of a general perspective space is plausible only on the assumption that he already knows that other minds exist, and it is admitted that the existence of another mind is an inference from the existence of another body. But how do I know that your body exists as the habitat and instrument of your mind, unless I already know that there is *one public space* in which your body and my body coexist? At the present moment, for example, I am not, so far as I am aware, in the immediate presence of any other mind. I am apprehending objects within my range of vision. Then in walks my wife and fills up part of this field of vision. Her body has entered that part of public space which I immediately perceive. She obtrudes herself upon my notice and speaks to me. I interrupt my work to reply. Unless I immediately apprehend space as the place of the simultaneous existence and interaction of things I certainly could not apprehend my wife's reality.

A perspective space can not be deduced from "private spaces." For, if we begin with self-enclosed private spaces we can never logically get into the public world and can never find any other mind. The other self—body and mind—must exist in public space. I believe that my wife exists because I immediately perceive one indivisible object—body and soul—in public space. I am not conscious of inferring by any process of ratiocination that her soul is there. I am immediately conscious of a living body which behaves in an intelligent and affectionate fashion. Of course I may be mistaken about her views or feelings on some matters. Then, in trying to find out what she does think or feel, I learn that knowledge in detail of another's state of soul does involve inference. But the immediate apprehension of minds and of the portions of space in which they live and express themselves are two aspects of the same realistic contemplation of things as they are. My knowledge of another mind's existence is logically as "primitive" as my knowledge of my own mind's existence. In both cases, for completer knowledge, I have to reflect, analyze, and infer. It is often quite as easy to know another's mind as to know one's own mind.

Psychological or "private" spaces, are, like sensations, of which indeed they are the "subjective" places, artificial constructions. They are not given, but constructed as the "imaginary" places for the variations in sense-perceptions. It is true that our spatial, like our other qualitative, apprehensions of things, vary. I do not perceive the surroundings precisely as my wife does. But, in so far as these differences of perception are due to differences of position and differences in the structures of our respective sensory apparatuses, the differences, too, are parts of the objective order of things in space. In so far as these differences may be due to differences in our mental histories they are parts of the past objective order which, through memory, functions in the present. In so far as they may be due to inherent psychical and physical differences in the make-up of our respective individualities they are due to what, for epistemology, must be regarded as ultimately real facts.

There is no difference in perception which is not a difference due to the fact that the real world is a system of interacting elements or *individua* of varying degrees of structural complexity. If there be such a thing as a psychical or spiritual principle of individuality, then your individuality and mine are true parts of the objective order, and your private views of things and mine are private only in the sense that one is the consequence of your individuality and position and the other is the consequence of my individuality and position. But individuality and privacy have no meaning except in relation to a public world and as parts of the whole apprehended reality. The real percipient, like the real object perceived, is never an isolated datum of experience. Just as a physical thing is a sensory complex attended to and discriminated from a vague background of apprehended reality, the individual percipient and agent is a felt center of reference for all sorts of relations.

The vague background of reality which we immediately apprehend, and the parts of which we differentiate and correlate in the analytic-synthetic growth of knowledge, is always spatial (and temporal). Space is apprehended immediately as the container or medium of existence for all things and their properties. Kant and the nativists are right to this extent—that an immediate spatial apprehension is presupposed in the barest modicum of perception (and similarly with time).

But, since sensory qualities change, things when defined as complexes of sensory qualities change and even vanish away. What then is the real thing? This is too large a problem to be adequately discussed at the tail end of a journal article. I will state briefly what I regard as the right point of view for treating the problems of thinghood, permanence, and substance. In the first place a thing does not change without other things changing in the same spatial and temporal stretch. Absolutely isolated change is no more real than absolutely isolated existence. The ice does not melt unless the temperature rises above 32° F. This statement is a symbol of a multitude of other conditions of change. The changes through which a thing ceases to be the same thing involve the interaction of elements in the one spatial whole and in the one temporal continuum of reality. Just as there is one objective spatial whole at any instant, of which we apprehend only fragmentary, though genuinely real, aspects, because we are localized centers in that whole, so there must be one objective temporal order or order of cosmical succession in which the changes that we observe and the changes that we undergo are factors.

Nowhere in science and philosophy is the pragmatic method more clearly applicable than to this problem of thinghood. For what common sense means by the sameness of the thing is just the sufficient persistence, for immediate apprehension, action, and enjoyment, of those qualitative complexes which are the actual things. A thing is any groupings of sensory qualities if, and so long as, for any purpose, this grouping can be treated as a persisting whole. A thing is the same so long as a self can count on finding the same qualities together in space. I say that I have put some peaches in the refrigerator. When I go there and find the expected complex of edible and enjoyable qualities I say that the peaches have kept well. If I find a rotten mush they have practically ceased to be the same. I seek the explanation of the change from edible things to an inedible mess in bacteria. The bacteria are, for purposes of explanation, things;

not for purposes of eating. The thing of common sense is a practical construction, that is, a construction relative to a desire and a purpose, and so is every so-called theoretical construction. Even the attempt to conceive ultimate and unchangeable things, such as atoms or egos, is simply the expression of the desire to get one's mental feet planted on something permanently permanent. The degree of thinghood that any complex of sensory qualities possesses is relative to its fulfilment of a purpose. The things of physics, "atoms," "electrons," are things for the very general and abstract purposes of the physicist. In so far as they fulfill those purposes in a clear and consistent fashion he can treat them as real. But in so far as they do not satisfactorily account for the complex and changing qualities of the empirical world, which are hourly and momentarily real for the fundamental business of individual and social living, common sense is justified in holding that "atoms" and "electrons" are but artificial constructions. Even law, morality, civil polity, art, and letters are full of such artificial constructions; not of course so abstract and unreal as "atoms" and "electrons," since they have more concreteness and individuality in their interpretation and use. And, in the last analysis, the real must be the whole spatial-temporal nexus or continuum which engenders the local and transitory qualitative complexes which we call empirical things and selves. The real world must, in some way, own all the qualities which, for the fulfilment of individual and social purposes, must be taken into account; either as furthering or as hindering these purposes. The real external world owns all the primary and secondary qualities; moreover since we *enjoy* nature selflessly and "uselessly," as well as use some of its powers, the real world must own qualities akin to the esthetic features that we find in it.

Naïve realism does not imply that objects experienced would exist exactly as they are experienced entirely apart from any experient. It does imply that experiencing does not falsify or distort real things. It implies, for me at least, that the percipient as well as the qualities perceived are true integral factors in the objective complex of things. Reality is a vastly complex and changing system which engenders at some places and moments in its career feeling and reacting centers in which its qualities become consciously focused, and through which they are under modification and rearrangement, but are neither created, annihilated, nor radically distorted. A world which can produce selves must have always been a world in which selfhood was implied. A world in which selves live only through dependence on and use and enjoyment of a physical order can never have been a world of disembodied spirits or Egos, whether one or many.

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